



**200W Ku-Band GaN Compact Outdoor SSPA**

## Description

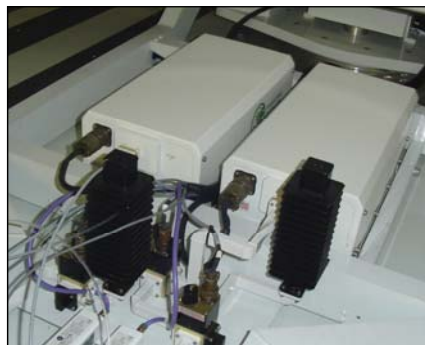
The Paradise Datacom Compact Outdoor Solid State Power Amplifier (SSPA) is built for extreme environmental conditions and high reliability operation. Along with the robust construction exists the highest power density in the industry. This allows solid state technology to be used in applications that have long been reserved for TWTAs.

At less than 40 lbs. (18 kg), and only slightly larger than a shoe box, this family of SSPAs is available in output power levels in the following range:

**Ku-Band: 200W**



Antenna-mount 1:1 system w/ mounting frame



SNG-mount 1:1 system w/ side-mount AC input

## FEATURES

- Compact size and weight
- CE Compliance Tested
- Integrated forced-air cooling system
- Adjustable RF Gain, 55 dB to 75 dB
- Extreme Environmental Testing
- RF Output Sample Port
- Maintenance Free Operation
- Universal, Power Factor Corrected Power Supply
- Built-in 1:1 Redundancy Control

## OPTIONS

- Antenna Mounting Kit
- Remote Control Panel
- L-Band Input
- FSK monitor & control via IFL
- Phase Combined Systems
- Wireless local interface - Bluetooth™ enabled
- Low line voltage operation
- Fiber Optic Input
- Optional side-mount AC input for SNG installations
- L-Band Bypass Switch for L-Band or RF input

## SPECIFICATIONS

- Compact Outdoor housing  
10.0 X 19.5 X 6.50 in  
254 X 495 X 165 mm  
36.0 lbs. / 16.4 kg;  
44.0 lbs. / 20.0 kg for higher powered units
- White powder coat finish
- Operating temperature:  
-40 to +50 °C

## Specifications, Ku-Band SSPAs

PARAMETER	NOTES	LIMITS	UNITS
Frequency Range	(see options for extended band)	14.00 to 14.50	GHz
Output Power @: P <sub>3dB</sub>	HPAKG200ACXXXXX	P <sub>3dB</sub> 52.5 (178)	dBm (W)
Power Requirements Line Voltage Line Frequency Line Power	power factor Line voltage Line frequency HPAKG200ACXXXXX	.98 90 to 265 47 to 63 1910	VAC Hz W

## Common Electrical Specifications

PARAMETER	NOTES	LIMITS	UNITS
Gain	range	55-75	dB
Gain Flatness	full band	±1.0	dB
Gain Slope	per 40 MHz	±0.3	dB/40 MHz
Gain Variation vs. Temperature	-40°C to +50°C	±1.0	dB
Gain Adjustment	0.1 dB resolution	20	dB
Intermodulation Distortion	Two-Tone 3 dB back off from P <sub>3dB</sub>	-25	dBc
AM/PM Conversion	@ rated P <sub>3dB</sub>	3.5	°/dB
Spurious Harmonics (SSPA only)	(@ rated P <sub>3dB</sub> ) (@ rated P <sub>3dB-3dB</sub> )	-70 -50	dBc dBc
Input/Output VSWR		1.30:1	
Noise Figure	at maximum gain	8	dB
Group Delay (per 40 MHz segment)	Linear Parabolic Ripple	0.01 0.003 1.0	ns/MHz ns/MHz <sup>2</sup> ns p-p
Transmit Band Noise Output Power Density	TX Band RX Band	-75 -150	dBW/4 KHz dBW/4 KHz
Residual AM Noise	0 - 10 KHz 10 KHz - 500 KHz 500 KHz - 1 MHz	-45 -20 (1.25 + log F) -80	dBc dBc dBc
Phase Noise (SSPA only)	Offset frequency from carrier 10 Hz 100 Hz 1 KHz 10 KHz 100 KHz 1 MHz	-90 -100 -110 -120 -125 -130	dBc/Hz dBc/Hz dBc/Hz dBc/Hz dBc/Hz dBc/Hz
RF Power Detector	P <sub>sat</sub> to (P <sub>sat</sub> -20 dBm)	20 ± 1.0	dBm

Specifications are subject to change.

## L-Band Operation

Paradise Datacom offers C-, X-, and Ku-Band amplifiers with an integrated L-Band Block Up Converter. The L-Band units utilize Paradise Datacom's proprietary ZBUC™ technology. The addition of a ZBUC™ to a Compact Outdoor SSPA typically increases the gain by 2-4 dB. The advantages of ZBUC™ technology include:

- ZBUC™ can detect and switch to an externally supplied reference.
- Optional internal high stability (10MHz) reference.
- ZBUC™ can lock to an externally supplied reference of 5, 10, 20, 25, or 50 MHz without modification.
- ZBUC™ can accept a wide range of external reference power (-10dBm to +5 dBm)
- ZBUC™ can accept FSK monitor and control signal via the IFL for complete amplifier remote control.

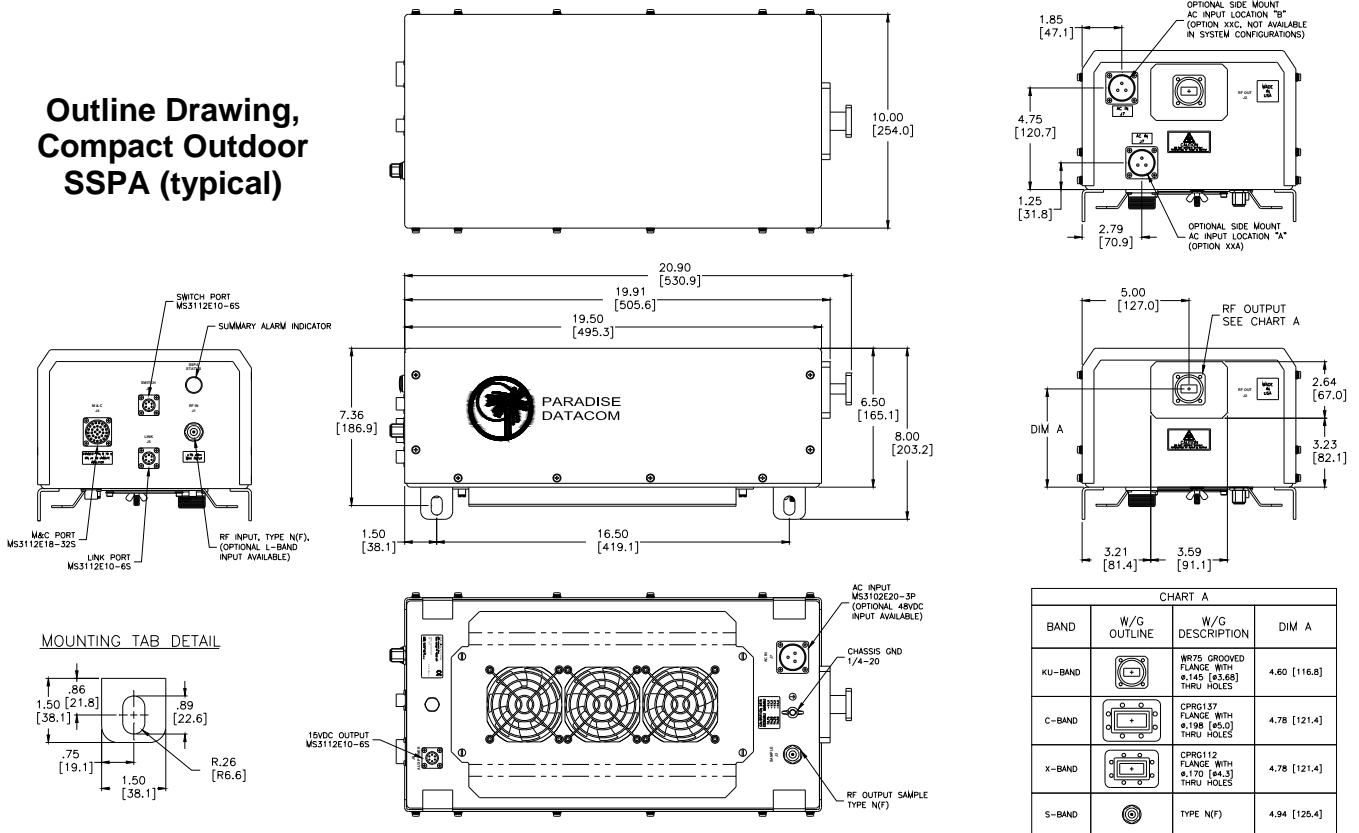
## Available Frequency Plans

Band	Frequency Band	IF Input	LO Frequency	RF Output	Gain Change
Ku	Standard Ku-Band	950 - 1450 MHz	13.050 GHz	14.00 - 14.50 GHz	0-2 dB
Ku	Extended Ku-Band	950 - 1700 MHz	12.800 GHz	13.75 - 14.50 GHz	0-2 dB

## Electrical Specifications for Compact Outdoor with ZBUC™

PARAMETER	NOTES	LIMITS		UNITS
Gain	Nominal setting	75		dB
Gain Flatness	full band	±2.0		dB
Gain Slope	per 40 MHz	±0.5		dB/40 MHz
Gain Adjusted Range	Typical Ku-Band Adj. Range	20		dB
Gain Stability	-40 to +60 °C	57 - 77		dB
Phase Noise	Offset frequency from carrier	<u>Absolute max.</u>	<u>Ku-band (typ.)</u>	
	10 Hz	-30	-50	dBc/Hz
	100 Hz	-60	-65	dBc/Hz
	1 KHz	-70	-72	dBc/Hz
	10 KHz	-80	-90	dBc/Hz
	100 KHz	-90	-110	dBc/Hz
Spurious	In-Band Signal Related			dBc
	Close to Carrier Spurious (≤ 20 MHz)			dBc
	Local Oscillator			dBm
	Non-Signal Related			dBm
Noise Figure	At 75 dB gain setting	20		dB
Input VSWR	L-Band	1.5 : 1		
Internal Reference Option	Reference accuracy @ 25 °C	±1 • 10 <sup>-8</sup>		
	Reference Stability over Temperature (-40 to +40 °C)	±1 • 10 <sup>-9</sup>		

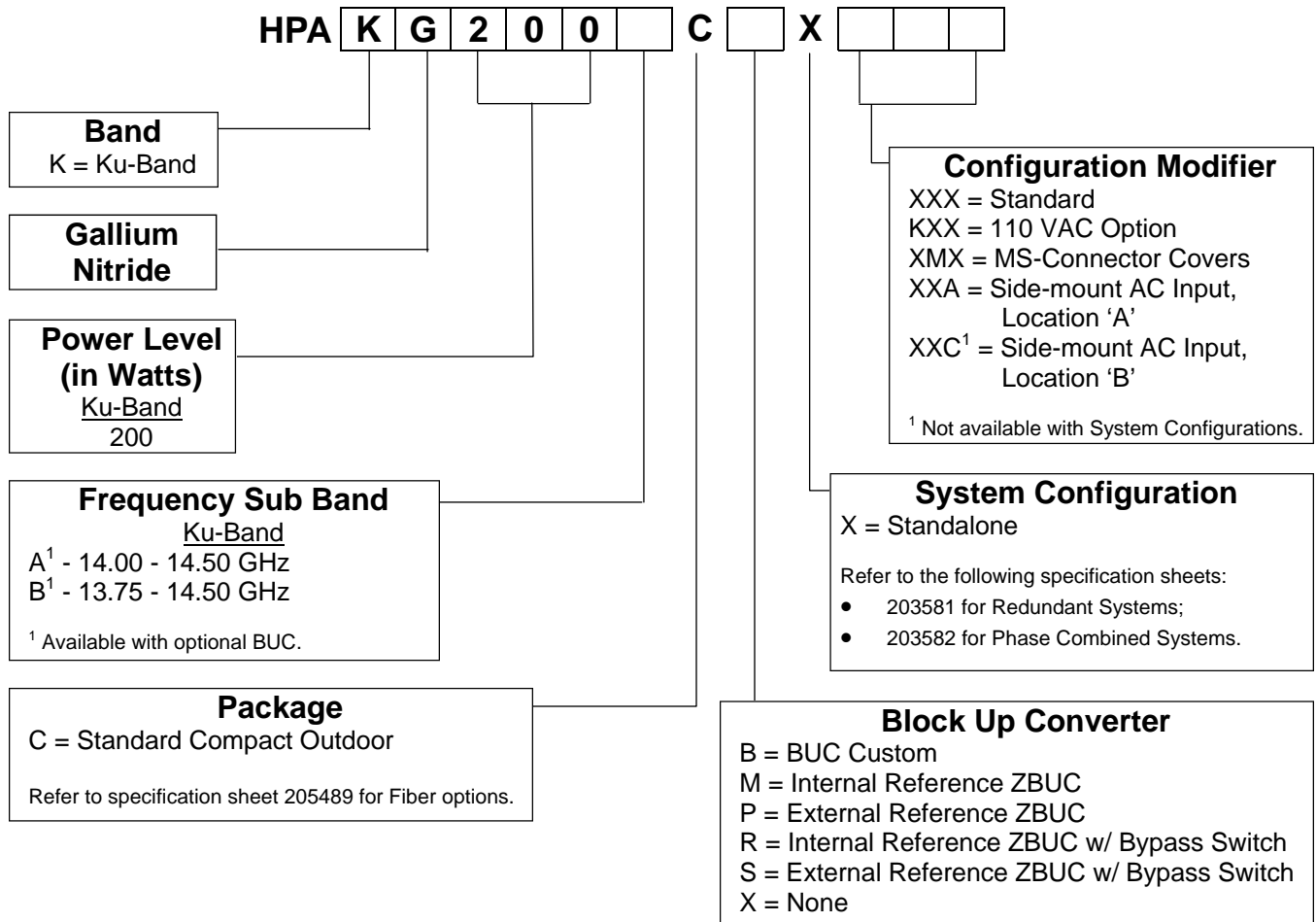
## Outline Drawing, Compact Outdoor SSPA (typical)



## Mechanical & Environmental Specifications

PARAMETER	NOTES	LIMITS	UNITS
Size	width X length X height	10.0 X 19.5 X 6.50 254 X 495 X 165	inches mm
Weight	200 W Ku-Band	44 (20.0)	lbs.(kg)
Finish		Paint	White; powder coat
Connectors	RF Input RF Output RF Output Sample Line Power Monitor and Control Link Port Redundancy Switch Auxiliary +15VDC LNB Power (500 mA)	Type N WR75 Waveguide Type N 3-pin MS-type 32-pin MS-type 6-pin MS type 6-pin MS-type 6-pin MS-type	Female Grooved Flange (PBR-120) Female Plug Socket Socket Socket
Operating Temperature	Ambient	-40 to +50	°C
Relative Humidity	Condensing	100	%
Cooling System	Integrated	Forced air	
Altitude	No temperature de-rating up to 10,000 ft, (3000 m) De-rate maximum temperature by 2°C per 1,000 ft (300 m) beyond 10,000 ft.		
Shock		50 g p-p, 11 msec pulses	
Vibration		3g rms 30 min. 5-2000 Hz	

**Part Number Configuration**



**Example:** A standalone 200W Ku-Band GaN Compact Outdoor SSPA with optional 110 VAC is part number: **HPAKG200ACXXKXX**.